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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/642,433

08/15/2003

Fred A. Brown

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9871

7590

09/02/2004

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EXAMINER

MULLINS, BURTON S

ART UNIT

PAPER NUMBER

2834

DATE MAILED: 09/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/642,433

Applicant(s)

BROWN, FRED A.

Examiner

Burton S. Mullins

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 21 and 22 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 4 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 5-6, 8-11, 13-14 and 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller (US 4,698,542). Muller '542 teaches a brushless DC motor including a stator 58, a rotor 14 with a rotor magnet 56 (Fig.1), and an arbor (bearing tube) 22/44 to at least in part secure the rotor to the stator (Fig.1), the rotor 14 having an inner surface defining a bounded region (Fig.1), the stator current controller comprising: a circuit board 20 coupled to the arbor 22/44 and, at least in part, within the bounded region (Fig.1), and a magnetic field detector (Hall sensor 35) mounted on the circuit board 20 for detecting a magnetic field produced by the rotor magnet 56 (Fig.1), the magnetic field detector 35 being within the bounded region (Fig.1).

Regarding claim 2, the board 20 is inherently flexible.

Regarding claims 5, 10 and 17, the detector 35 comprises a Hall chip and is surface mounted on the board.

Regarding claim 8, the detector 35 comprises means for detecting a magnetic field; the circuit board 20 comprises means for mounting the detector 9; and means are inherent for connecting the circuit board 20 with arbor 22/44 within the bounded region (c.3, lines 11-13).

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Regarding claim 11, Hall means 9 inherently produces a voltage proportional to the magnetic field.

3. Claims 1-2, 5-11, 13-14 and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Egami (US 4,620,139). Egami teaches a brushless DC motor including a stator 1, a rotor 20 with a rotor magnet 2 (Fig.1), and an arbor (bearing holder) 9a to at least in part secure the rotor to the stator (Fig.1), the rotor 20 having an inner surface defining a bounded region (Fig.1), the stator current controller comprising: a circuit board 3 coupled to the arbor 9a and, at least in part, within the bounded region (Fig.1), and a magnetic field detector (Hall sensor) 5 mounted on the circuit board 3 for detecting a magnetic field produced by the rotor magnet 2 (Fig.1; c.7, lines 33-34), the magnetic field detector 5 being within the bounded region (Fig.1).

Regarding claim 2, the board 20 is inherently flexible.

Regarding claims 5, 10 and 17, the detector 5 comprises a Hall chip and is surface mounted on the board.

Regarding claims 7 and 20, the schematic of circuit board 3 in Fig.6 includes connection 34 to a voltage source, connection 35 to ground, and plural connections 30/33 to stator windings 4a/4a'.

Regarding claim 8, the detector 5 comprises means for detecting a magnetic field; the circuit board 3 comprises means for mounting the detector 5; and means are inherent for connecting the circuit board 3 with arbor 9a within the bounded region.

Regarding claim 11, Hall means 5 inherently produces a voltage proportional to the magnetic field.

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4. Claims 1-3, 5-11, 13-15, 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller (US 4,547,714). Muller '714 teaches a brushless DC motor including a stator 22, a rotor 12 with a rotor magnet 14 (Fig.1), and an arbor 34 to at least in part secure the rotor to the stator (c.3, lines 27-28), the rotor having an inner surface defining a bounded region (Fig.1), the stator current controller comprising: a circuit board (on plate 32; c.3, line 67) coupled to the arbor 34 (via stator 22) and, at least in part, within the bounded region (Fig.1), and a magnetic field detector (Hall sensor) 16 mounted on the circuit board for detecting a magnetic field produced by the rotor magnet (c.3, lines 17-21), the magnetic field detector 16 being within the bounded region (Fig.1).

Regarding claim 2, the board 1 is inherently flexible.

Regarding claims 3 and 15, the detector 16 is closer to the bottom end of the arbor than the top end (Fig.1).

Regarding claims 5-6, 10 and 17-18, the detector 16 comprises a Hall chip and is surface mounted on the board (Fig.3).

Regarding claims 7 and 20, the schematic of the circuit board in Fig.3 includes connections to a voltage source and ground 47/54, and plural connections 42/43 to stator windings 40/41.

Regarding claim 8, the detector 16 comprises means for detecting a magnetic field; the circuit board comprises means for mounting the detector; and means comprising screws 35 and pins 30 connect the circuit board with arbor 34 via the stator 22 within the bounded region (see Fig.1).

Regarding claim 11, Hall means 16 inherently produces a voltage proportional to the magnetic field.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Muller '542 in view of Ohiwa et al. Muller '542 teaches a circuit board voltage source connection (c.3, lines 23-24), but does not explicitly disclose ground and stator winding connections. Ohiwa, Fig.11, shows a prior art circuit board 11 with various drive IC parts 65 including connections to voltage supply 64, ground (not numbered) and windings 24a/24b (c.1, lines 48-55). It would have been obvious provide Muller '542 with such circuit board connections per Ohiwa for the purpose of driving the motor.
7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over any one of Muller '542, Egami and Muller '714 as applied to claim 8, in view of Molnar (US 5,895,994). Muller '542, Egami and Muller '714 do not teach snap connection means.

Molnar teaches a motor including circuit board 64 connected to stator end cap 58 by means of snap connections 72 (Fig.1; c.4, lines 12-30) which provide rapid, precise and secure mounting of the circuit board (c.1, lines 56-64).

It would have been obvious to one of ordinary skill to provide snap connection means per Molnar to connect the circuit board to the arbor in Muller '542, Egami and Muller '714

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since snap connection means are desirable for rapid, precise and secure mounting of a circuit board (c.1, lines 56-64).

Allowable Subject Matter

8. Claims 4 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. Claims 21-22 are allowed. Applicant incorporates indicated allowable subject matter of claims 4 or 16.

Response to Arguments

10. Applicant's arguments filed 9 August 2004 have been fully considered but are moot in view of the new grounds of rejection.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 571-272-2029.

The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be

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reached on 571-272-2034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
31 August 2004